SECTION 23 37 13

DIFFUSERS, REGISTERS, AND GRILLES

1.0 GENERAL

1. DESCRIPTION
   1. All work specified in this Section is governed by the Common Work Results for HVAC Section 23 05 00.
   2. This Section 23 37 13 and the accompanying drawings cover the provisions of all labor, equipment, appliances and materials, and performing all operations in connection with the construction and installation of air distribution devices as specified herein and as shown. These units include, but are not limited to the following:
      1. Ceiling Diffusers (CD)
      2. Return Air Grilles (RAG)
      3. Exhaust Registers (ER)
      4. Exhaust Grilles (EG)
      5. Supply Registers (SR)
      6. Curved Supply Registers (CSR)
      7. Return Air Registers (RAR)
      8. Linear Slot Diffusers (LSD)
      9. Linear Return Slots (LRS)
      10. Linear Exhaust Slots (LES)
      11. Transfer Grilles (TG)
      12. Architectural Linear Slot (ALSD)
      13. Residential Supply/Return Registers (RSR/RRR)
      14. \*\*Residential Filtered Returns (RFR)
2. INTENT
   1. It is the intent of this Section of the specifications to provide complete, operable, adjusted air distribution devices as shown and specified which are free of excessive noise, vibration and airflow fluctuations.
3. SELECTION CRITERIA
   1. All air distribution devices shall be selected in accordance with the following minimum criteria unless otherwise noted below or on the drawings:
      1. Method of mounting shall be compatible with the ceiling, wall or duct surface which it mounts on or in; i.e. lay-in, surface mounting, plaster frame, duct collar, etc. The architectural drawings shall be referenced to determine the mounting method for each device. All flanges on surface mounted devices shall be provided with a gasket.
      2. Finish of all ceiling mounted devices shall be selected to match the color of the adjacent ceiling. Finish of all wall mounted devices shall be primer which is compatible with the finish coating specified for the adjacent wall; finish coat will be applied under Division 9.
4. BASIS OF DESIGN
   1. The basis of design is Titus. Any proposed substitutions shall be proven equal in all respects to the equipment specified as the basis of design. Any modifications to ductwork, controls, ceilings, building structure, etc., that result from any substitution shall be coordinated with all trades. This coordination shall occur before delivery of equipment and any modifications shall be performed without incurring additions to the Contract.
5. ACCEPTABLE MANUFACTURERS
   1. Acceptable manufacturers are Price, Carnes, Metal Aire, Krueger, Nailor, and Titus UON, provided that their units, performance, appearance and physical characteristics are equal in all respects for this specific project.

2.0 PRODUCTS

1. DESCRIPTION
   1. Ceiling Diffusers (CD)
      1. Ceiling diffusers (CD) shall be square, plaque face diffusers capable of providing 360° radial air pattern; Titus Model OMNI with directional blow clips. The diffuser shall have a 22 gauge steel face panel that captures a secondary 22-gauge panel. The face panel shall be removable by means of four hanger brackets. The exposed surface of the face panel shall be smooth, flat, and free of visible fasteners. The back pan shall be one piece precision die-stamped and shall be constructed of 22-guage steel. Diffuser performance data shall be in accordance with ANSI/ASHRAE Standard 70-2006. The maximum NC level at design airflow shall not exceed 35 when measured in a direct field 5'-0" from the face of the device. Diffusers to be 24"x24" unless noted on drawings. The finish shall be baked enamel white, unless directed otherwise by the Architect. Provide plaster frames and round neck damper (operable from face of diffuser) for diffusers installed in hard ceilings.
   2. Return Air Grilles (RAG)
      1. Return air grilles shall match the ceiling diffusers in the area or shall be hollow core, perforated face, lay-in type, selected to match the CDs; with the largest neck size available UON Titus PAR. \*\*Opposed blade dampers shall be provided with each RAG\*\*. Performance data shall be in accordance with ADC 162R4. All other characteristics shall be equal to the ceiling diffusers.
   3. Exhaust Registers (ER)
      1. Exhaust registers shall be surface mounted, fixed curved blade steel registers with blades at 0.666 to 0.750 inches on center. Provide opposed blade dampers with each ER for balancing purposes. ERs shall be Titus 350ZRL sized as indicated.
   4. Exhaust Grilles (EG)
      1. Exhaust grilles shall be the same as the return air grilles except the EGs shall have an opposed blade damper for balancing.
   5. Supply Registers (SR)

1. Supply registers shall be surface mounted, steel with aluminum blades, adjustable double-deflection type complete with opposed blade dampers for balancing purposes. The outermost set of deflection blades shall be parallel to the long dimension of the SR and the innermost set of deflection blades shall be parallel to the short dimension of the SR. The registers shall be tested in accordance with ADC standards and shall be selected to provide design airflow at a maximum NC of 35. SRs shall be Titus 272R.

* 1. Curved Supply Registers (CSR)
     1. Curved registers shall be duct mounted, aluminum, radius end cap, radius to match the installation duct system, adjustable double-deflection type complete with air scoop dampers for balancing purposes. The outermost set of deflection blades shall be parallel to the long dimension of the CSR and the innermost shall be parallel to the short dimension of the CSR. The register shall have foam gasketing. The register shall be tested in accordance with ADC standards and shall be selected to provide design airflow at a maximum NC of 35. CSRs shall be Titus S300F and be mounted directly to the duct where not externally insulated, or flush with the exterior insulation, as applicable.
  2. Return Air Registers (RAR)
     1. Return air registers shall be surface mounted, steel, registers with curved hemmed edge blades with an opposed blade damper. Damper blades shall be gang operated by means of a key which can be removed after balancing. RARs shall be Titus 350ZRL, except RARs shown on the return air boot detail with upturned blades shall be Titus 350RL, sized as indicated.
  3. Linear Slot Diffusers (LSD)
     1. Supply (LSD)
        1. Linear slot diffusers shall be Titus ML-39. Diffusers shall be of aluminum construction with one or more parallel slot(s). Diffusers shall have two (2) slots unless otherwise indicated. Each slot shall contain pattern controls, adjustable from the face of the diffuser. Each LSD shall be continuous length as indicated on the drawings, complete with finished ends, mitered corners and splined joints. All inactive sections of the LSD considered as LRS devices. Plenums shall have round collars for connection of flexible duct. Each LSD shall be provided with a lined steel plenum with tappings for round duct connections as indicated. Maximum NC level per ADC shall not exceed 35 at design airflow. Liner shall conform to NFPA 90A 25/50 requirements. Border option to be selected by Architect and shall be appropriate for the installation location. **Borders in drywall ceiling shall have mud-in flange unless otherwise directed.**
     2. Return (LRS)
        1. Linear return slots shall equal specified LSD with the following exceptions:
           1. Plenums shall be lined in accordance with UL 181 and NFPA 90A for two and four foot sections, and insulated light shields where plenums do not fit.
           2. Pattern controls are not required.
     3. Exhaust (LES)
        1. Linear exhaust slots shall equal specified LSDs with the following exceptions:
           1. Plenums shall be lined in accordance with UL 181 and NFPA 90A.
           2. Pattern controls shall be used for dampering only.
  4. Transfer Grilles (TG)
     1. Transfer grilles shall be similar to return air grilles (RAG).
  5. Architectural Linear Slots (ALS)
     1. Supply (ALSD)
        1. Architectural linear slot diffusers shall be Titus FL-20 wide body linear diffuser. Diffuser shall be aluminum construction with one (1) 2” wide slot. Diffuser shall be equipped with an individually adjustable pattern controller. Each ALSD shall be provided with a lined stem plenum with tappings for round duct connections as indicated. Maximum NC level per ADC shall not exceed 35 at design airflow. Linear shall conform to NFPA 90A 25/50 requirements. All inactive sections of the LSD considered as ALSR devices. Border option to be selected by Architect and shall be appropriate for the installation location. **Borders in drywall ceiling shall have mud-in flanges unless otherwise directed.** Device shall be custom curved as required to match the nearest wall.
     2. Return (ALSR)
        1. Architectural return slot to be same as supply with the exception that the pattern controllers shall be removed to allow maximum free area. All returns shall be fitted with lined plenums for two and four foot sections, and insulated light shields where plenums do not fit.
  6. Residential Registers (RSR/RRR)
     1. Residential Supply Registers (RSR) shall be heavy gauge all steel welded construction; ProSelect or substitution by Hart & Cooley or Shoemaker. RSRs shall have three-way air pattern and shall have face-adjustable damper. Registers shall have externally insulated sheet metal plenum area equal to the register, minimum 9” depth. Penetrations through rated assemblies shall include fire and/or smoke dampers, rated appropriately for the penetration.
     2. Coordinate with Architectural plans for any rated system penetrations. Penetrations shall be provided with ¼” thick 30”X 30” Prefco ceramic insulating blanket and Prefco 5610 fire radiation damper such that each air device assembly is certified for installation in for installation in a fire-rated ceiling in accordance with UL Classification R7365.

3.0 EXECUTION

1. INSTALLATION
   1. Air distribution devices shall be installed as indicated and in conformance with the manufacturer's recommendations. The color, frame, and border types shall be coordinated with Architectural requirements and shall be selected to install in the finished surface indicated.
   2. All air distributions devices to be reused shall be installed the same way as indicated for new devices. All existing color, frame, and border types shall modified as required to match new device requirements.
   3. All air distribution devices with blade orientations shall be coordinated with Architect. Specific attention is called to devices in exposed ceiling areas, including wall-mounted.
2. ADJUSTMENT
   1. Grilles, registers, diffusers, etc. shall be tested and adjusted to provide the scheduled air flow capacities.
   2. All devices shall have adjustable and accessible volume dampers. Where dampers are not or will not be accessible without access panels, provide and install remote balancing cable control system, Young Regulator or equal. Adjustment shall be from the face of the air distribution device, coordinated with the Air Distribution Manufacturer. Coordinate the location and size of the damper with the installation.
   3. All adjustable air distribution devices located within three feet of any wall shall be set to blow directly away from, or parallel to, the wall or hood.
   4. In all slot diffuser applications, the inactive sections of the slot shall be finished with perforated steel, painted flat black, selected to match the SDs. These sections shall be open to the plenum as a return air path. Inactive sections shall have an insulated light shield.

END OF SECTION